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Amendment
Attorney Docket No. P68.2A-11534-US01

Amendments To The Claims:

1. **(Currently Amended):** A lift drive comprising:
a plastic spiral drive element having an axis of rotation;
a single plastic rack having a base and a plurality of teeth extending from said base,
wherein each tooth has a thrust surface sized and shaped to be engaged by said spiral drive
element, said base having a reinforcing element, and said rack having a longitudinal axis
parallel to said axis of rotation; and
a motor coupled to said spiral drive element for to rotate rotating said spiral drive
element, ~~wherein upon said spiral drive element rotating, one of said spiral drive element and~~
~~said rack moves relative to the other along said longitudinal axis;~~ and
a movable carriage having wheels, said motor being mounted onto said carriage;
wherein upon said spiral drive element rotating, one of said spiral drive element and
said rack moves relative to the other along said longitudinal axis in a lift direction or a
lower direction.
2. **(Original):** A lift drive as claimed in claim 1 wherein said spiral drive element moves
and said rack is stationary.
3. **(Original):** A lift drive as claimed in claim 1 wherein said spiral drive element includes
between one and twelve generally spiral drive threads, each of said drive threads engaging at
least one of said rack teeth.
4. **(Currently Amended):** A lift drive as claimed in claim 2 3 wherein ~~there may be~~ at least
one of said spiral drive threads engages at least two teeth on said rack at once.
5. **(Cancelled):** ~~A lift drive as claimed in claim 2 further including a moveable carriage,~~
~~said motor and said spiral drive element being mounted onto said carriage.~~

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6. **(Currently Amended)** A lift drive as claimed in claim 5 2 wherein said carriage includes a plurality of wheels and said rack is fixed to a rail by said base and wherein said rail includes wheel guides to guide said wheels and thereby said carriage along said rail.
7. **(Original):** A lift device as claimed in claim 2 wherein each of said teeth includes a thrust surface sized and shaped to engage at least one of spiral drive threads of said spiral drive element.
8. **(Original):** A lift device as claimed in claim 1 wherein said rack includes teeth that are spaced apart by a distance "a" and the number of teeth passed per revolution of said spiral drive element is determined by the number of threads on said spiral drive element, wherein the speed of said movement along said longitudinal axis is proportional to the number of spiral drive threads as well as the spacing "a" of said teeth.
9. **(Original):** A lift device as claimed in claim 1 wherein said device further includes a gearbox to operatively couple said motor to said spiral drive element, whereby said spiral drive element is rotated at a speed suitable from producing an acceptable linear speed for said drive element along said track.
10. **(Original):** A lift device as claimed in claim 9 wherein said motor has a predetermined output speed, and said spiral threads of said spiral drive element have a preselected pitch, having regard to said speed of rotation of said drive element and said tooth spacing to drive said carriage along said rack at a predetermined speed.
11. **(Currently Amended):** A lift device as claimed in claim 3 wherein said ~~linear~~-lift drive has a predetermined load capacity, and sufficient number of spiral drive threads are provided to permit enough teeth to be simultaneously engaged to support said load capacity together with a reasonable factor of safety.

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12. **(Original):** A lift device as claimed in claim 11 wherein said factor of safety is at least 1.5.
13. **(Currently Amended):** A lift device as claimed in claim 1 wherein said spiral drive element and said teeth are selected from materials which in combination ~~having~~ have a low coefficient of friction.
14. **(Original):** A lift device as claimed in claim 13 wherein said coefficient of friction is between 0.03 and 0.18.
15. **(Cancelled):** ~~A lift device as claimed in claim 14 wherein both said spiral drive element and said teeth are made from plastic.~~
16. **(Currently Amended):** A lift device as claimed in claim ~~15~~ 13 wherein said spiral drive thread is made from oil impregnated plastic.
17. **(Original):** A lift device as claimed in claim 16 further including a gear box between said motor and said spiral drive element, said gear box providing a speed reduction of between about 8 to 1 and 60 to 1.
18. **(Currently Amended):** A lift device as claimed in claim 17 wherein said gear box and spiral drive element have a combined efficiency of between 35% to 88%.
19. **(Currently Amended):** A lift device as claimed in claim 18 wherein said ~~worm~~ spiral drive element and said rack have an efficiency of between 70% and 86%.
20. **(Currently Amended):** A drive device for lifting loads comprising:
a moveable carriage having wheels;
a motor carried by said carriage, said motor having an output shaft;
a gearbox attached to said output shaft to reduce a speed of revolution transmitted by said motor, such gearbox being configured for maximum efficiency,

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a plastic threaded spiral drive element attached to and driven by an output shaft of said gearbox; and

a single plastic fixed rack having teeth sized and shaped to be engaged by said threaded spiral drive element, said rack being reinforced,

wherein upon said motor being activated said spiral drive element drives said carriage longitudinally along said rack.

21. (Original): A drive device as claimed in claim 20 wherein said fixed rack and said threaded spiral drive element are made from lightweight materials.

22. (Currently Amended): A drive device as claimed in claim 21 wherein said fixed rack and said threaded spiral drive element are each made from different types of plastic.

23. (Original): A drive device as claimed in claim 22 wherein at least one thread of said threaded spiral drive element is sized and shaped to engage more than one tooth of said rack to distribute the load being lifted.

24. (Currently Amended): A drive device as claimed in claim 20 wherein said spiral drive element includes more than one thread to simultaneously engage more than one tooth of said rack to distribute the load being lifted between said teeth being engaged.

25. (New): A lift drive as claimed in claim 9 wherein said gear box provides a speed reduction of between about 20 to 1 and 30 to 1.

26. (New): A lift drive as claimed in claim 1 further including a safety brake for said drive element, said safety brake having a braking force which increases with increased load.

27. (New): A lift drive as claimed in claim 26 wherein said safety brake is positioned in a load-bearing portion of said lift drive.

28. (New): A lift drive as claimed in claim 27 wherein said safety brake is co-axial with said

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spiral drive element and is located at an opposite end of said spiral drive element from said motor.

29. (New): A lift drive as claimed in claim 28 wherein said safety brake is a cone brake, having a conical braking element contacting a conical braking surface.

30. (New): A lift drive as claimed in claim 29 further including a one way bearing, said one way bearing freely turning in said lift direction but not turning in said lower direction.

31. (New): A lift drive as claimed in claim 30 wherein said one way bearing is positioned to cause said conical braking element to slip against said conical braking surface in said lower direction.

32. (New): A drive device as claimed in claim 20 further including a safety brake located between said motor and said drive element, said safety brake having a braking force which increases with increased load.

33. (New): A drive device as claimed in claim 20 wherein said fixed rack is comprised of a plurality of sections, each of said sections comprising a plastic molded body having a base and a plurality of teeth extending from said base, each tooth including a thrust surface sized and shaped to have sliding contact with a thread from a worm gear, said body further including a reinforcing element.

34. (New): A drive device as claimed in claim 33 wherein said reinforcing element for said section is a metal reinforcing element and provides dimensional stability to said plastic molded body under load.

35. (New): A drive device as claimed in claim 34 wherein said section is molded with a void and said reinforcing element is sized and shaped to fit into said void.

36. (New): A drive device as claimed in claim 35 wherein said reinforcing element is

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separated from either end of said section by a plastic section, whereby said section can be axially pre-loaded.

37. (New): A drive device as claimed in claim 33 wherein said base of each of said sections further includes shoulders for retaining said section in a track.

38. (New): A device for moving loads comprising:

a single rail;

a movable carriage having wheels, said wheels engaging the rail to keep said carriage on the said rail, wherein said rail guides said carriage along a path;

a motor carried by said carriage, said motor having an output shaft;

a gearbox attached to said output shaft to reduce a speed of revolution transmitted by said motor;

a plastic spiral drive element attached to and driven by an output shaft of said gearbox;

and

a rack fixed to said rail, said rack having plastic molded teeth having angled thrust surfaces sized and shaped to be in sliding contact with said threaded spiral drive element, a plastic molded base and a metal reinforcing element in said base;

wherein upon said motor being activated said spiral drive element moves said carriage along said rack.

39. (New): A device for moving loads comprising:

a single rail;

a movable carriage having wheels, said wheels engaging the rail to keep said carriage on the said rail, wherein said rail guides said carriage along a path;

a motor carried by said carriage, said motor having an output shaft;

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a gearbox attached to said output shaft to reduce a speed of revolution transmitted by said motor;

a plastic spiral drive element attached to and driven by an output shaft of said gearbox, said spiral drive element having a number of individual spiral drive threads; and

a sectioned rack fixed to said rail, each of said rack sections having plastic molded teeth, each tooth having a thrust bearing surface, a plastic molded base and a metal reinforcing element in said base;

wherein said thrust bearing surface is sized and shaped to match said spiral drive thread to distribute a load of said drive thread across said thrust bearing surface to reduce point loading on said tooth and said spiral drive thread.

40. (New): A lift drive device comprising:

a single rail;

a plastic molded rack retained in said rail, said rack having a reinforced base and a plurality of teeth extending from said base, wherein each tooth has a thrust surface sized and shaped to be engaged by a spiral drive element, said reinforced base being sized and shaped to permit a limited amount of deformation under preloading wherein said rack deforms less under live loads; and

a wheeled carriage moveable along said rail, said moveable carriage including:

a plastic spiral drive element having an axis of rotation and being sized, shaped and positioned to engage said teeth of said rack; and

a motor to rotate said spiral drive element;

wherein upon said spiral drive element rotating, said wheeled carriage advances along said rack and said rail.

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41. (New): A lift drive device as claimed in claim 40 further including a safety brake for said drive element.